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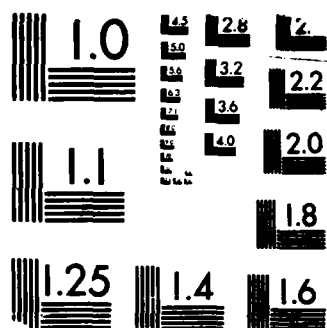
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THE PROBLEM OF SPACE IN SOVIET OPERATIONAL ART

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The views expressed here are those of the
Soviet Army Studies Office. They should not
necessarily be construed as validated threat doctrine.

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FORWARD

This essay was prepared under the auspices of the Office of the Secretary of Defense, Deputy Secretary of Defense [P]/ Policy Support Programs. It provides commentary and context to the Soviet General Staff's approach to the study and preparation of *space* space [izuchenie i podgotovka kosmosa] as an arena for the conduct of military actions. These comments are based up a *by General-Major I. B. Shaposhnikov* lecture given at the Voroshilov Academy of the General Staff in the mid 1970s and draw upon a larger study of these issues which was under taken while I was a Summer Fellow with the Center for Strategic Technology of the Texas A & M University System.* I wish to acknowledge a debt of gratitude to my fellow researchers on that project, especially Professors Richard Thomas & Alfred Monks, and to my SASO colleagues, especially Drs. Bruce Menning and Graham Turbiville, who provided valuable advice and criticism.

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*Jacob W. Kipp et al., "Soviet Views on Military Operations in Space" in: Stratech Studies Series (College Stations, Texas: Center for Strategic Technology, Texas A * M University System, 1986).

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THE PROBLEM OF SPACE IN SOVIET OPERATIONAL ART

This lecture on the principles of the employment of military spacecraft has several features which should be of compelling interest to the Western defense community. The first point to be made concerns the context and location of the lecture itself. General-Major I. B. Shaposhnikov delivered it at the Voroshilov Academy of the General Staff in Moscow. Shaposhnikov, an officer in the Soviet Air Force and a teacher in the Aviation Department of the Academy, is the son of the late Marshal Boris Mikhailovich Shaposhnikov, tsarist general staff officer, Soviet military specialist, and chief of the Soviet General Staff, 1937-1940, 1941-1942. Marshal Shaposhnikov, one of the most influential proponents of a powerful general staff system as the "brain of the army", considered the injunction of Moltke, the Elder, the proper model of a good general staff officer, who "should always be more than he seems." Like Moltke, the Elder, Marshal Shaposhnikov became the confidant of his ruler -- a much more difficult and dangerous task for the latter figure in time of Stalin's terror -- and has become a model of the talented, educated, and efficient general staff officer (genshabist) who upholds the values and traditions of Soviet "staff culture."¹

The location of the lecture also carries its own special significance with regard to the inculcation into Soviet senior officers of the preeminent values of that "staff culture." In the

¹ P. A. Zhilin, O voine i voennoi istorii, (Moscow: Voenizdat, 1984), p. 530; and A. V. Vasilevsky and M. V. Zakharov, "predislovie," in: B. M. Shaposhnikov, Vospominaniia. Voенно-nauchnye trudy (Moscow: Voenizdat, 1974), pp. 3-31.

first place, the Voroshilov Military Academy of the General Staff stands at the pinnacle of the Soviet system of military education where generals, admirals and senior officers of all branches of the Soviet Armed Forces and those of allied and associated states are prepared to assume staff and command positions at the operational-strategic level. Within its walls the periodic retraining of the command personnel of the Warsaw Treaty Organization is also carried out. Its instructional staff is also charged with major research functions in the following areas: problems of military science and military art, and the improvement of the material-technical base of the Soviet Army and Navy and their structures.² If the General Staff is the "brain of the Soviet Armed Forces," then its Academy stands at the very center of its cortex.

This institution has a capital role in the application of foresight [predvidenie] to military affairs. Such foresight has been defined as "the process of cognition of possible changes in the area of military affairs, the determination of perspectives of their future development."³ Such foresight, which has been an attribute of great captains throughout history, has been

² V. G. Kulikov, ed., Akadeniia General'nogo shtaba. Istoriia Voennoi ordenov Lenina i suvorova I stepeni akademii General'nogo shtaba Vooruzhennykh Sil SSSR im. K. E. Voroshilova (Moscow: Voenizdat, 1976), p. 5.

³ Voennyi entsiklopedicheskii slovar' (Moscow: Voenizdat, 1983), p. 585.

identified by Soviet military writers as "the most important quality of military cadres."⁴

In the 1920s employing a synthesis of professional staff studies, historical analysis, a systematic critique of foreign writings on trends in military development and Marxist-Leninist ideology Soviet military intellectuals developed a methodology for the study of future war, which went beyond the intuition of the great captains and sought to be more systematic and analytical.⁵ Since the on-set of the scientific-technical revolution in military affairs, associated with the introduction of nuclear weapons and ballistic missiles in its initial phase, foresight has taken on ever greater importance. In the wake of the publication of Voennaia strategii, a collective work authored by faculty of the Military Academy of the General Staff under the editorship of Marshal V. D. Sokolovsky, a former chief of the General Staff, Soviet military authors pointed to a profound change in the very nature of foresight itself. As General-Major S. Kozlov observed in 1964,

Soviet military science has discerned all these new phenomena of armed struggle. It has defined the essence of the deeply revolutionary process, which are taking place in military affairs; it has researched and evaluated the conditions under which they inevitably appear. As a result, it has been able to give a coherent, scientifically-based concept of the character of modern war, which is, as opposed to what happened in the past, based not so much on the experience of past

⁴ Ibid..

⁵ Sovetskaia voennaia entsiklopediia, 2 vols. incomplete (Moscow: Gosudarstvennoe Slovarno-Entsiklopedicheskoe Izdatel'stvo, 1933), II, cc. 843-844.

wars, as on scientific foresight and a forecast of a possible future.⁶

The acceptance of thermonuclear-missile war as the probable model of systemic war between the capitalist and socialist system, which dominated Soviet military thought in the early 1960s, underwent serious re-examination of the next decade. Both sides of the Cold War began to edge away from the sort of conflict which their nuclear arsenals equipped them to fight. The Soviet debate was driven by a need to re-estimate the impact of nuclear weapons on the whole range of conflicts which could be understood under the rubric of "future war." This was, indeed, a formidable challenge.

Between the publication of Voennaia strategiiia and our lecture we have a decade of profound changes, which recast the very nature of the scientific-technical revolution in military affairs, in the process redefining the meaning of reconnaissance and troop control and in the process introducing space as a combat environment. As General of the Army I. E. Shavrov and Colonel M. I. Galkin, respectively Chief of the Voroshilov Military Academy of the General Staff and one of its teaching staff, observed in 1977:

The contemporary period of military construction is characterized by the unprecedented intensity of the renewal of the means of war, the appearance of qualitatively new types of weapons and equipment, by searches for such forms and means of strategic, operational and tactical action, which have never been

⁶ S. Kozlov, "K voprosu o razvitii sovetskoi voennoi nauki posle vtoroi mirovoi voiny," Voennaia mysl' No. 2, (February 1964), p. 64.

employed by a single army of the world. New means of the conduct of military actions, new ways of perfecting the organizational structure of the armed forces, methods of their combat preparation and raising the combat readiness must be found and theoretically substantiated before they can become the property of military praxis. All this leads to a sharp rise in the role of military science, which has become the most important factor of the combat might of the armed forces, and scientific troop control is the decisive condition for the achievement of victory.⁷

The relationship between military science and foresight is explicit for, as these authors emphasize, "In its essence, military science is the science of future war."⁸

Shaposhnikov's lecture should those be understood as an exploration of the role of the "military space system" in the conduct of future war. The vital concept is the notion of system itself as a totality of inter-acting and mutually supporting subsystems, the components of which are well-defined by Shaposhnikov. Those familiar with Soviet writings on U. S. military space efforts will not find those mode of discourse particularly novel. Soviet authors have for over two decades analyzed U. S. capabilities in such a fashion.⁹ Such analysis features prominently in Soviet works devoted to various aspects of the military utilization of space, including anti-missile defense [protivoraketnaia oborona] and anti-space defense

⁷ I. E. Shavrov and M. I. Galkin, eds., Metodologiya voenno-nauchnogo poznaniia (Moscow: Voenizdat, 1977), pp. 3-4.

⁸ Ibid., p. 64.

⁹ A. Vasilyev, "Development of Space Systems of Armament in the U. S.," Voennaia mysl', No. 3, (March 1967), pp. 54-63.

[protivokosmicheskaiia oborona]. General-Lieutenant I. I. Anureev, who was also a professor at the Voroshilov Academy of the General Staff during this period, employed such a framework in his analysis of the inter-actions among systems of strategic ballistic missiles, anti-ballistic missiles defense, and anti-space defense. Anureev, however, relied on technical data from existing and proposed U. S. systems and couched his presentation reflecting the views of U. S. military specialists.¹⁰ In his review of means of anti-missile and space defense Anureev concluded that current ballistic systems were not a satisfactory solution and pointed towards U. S. laser research efforts and the development of solar-powered and nuclear-powered systems placed on board orbiting space interceptors and space stations of anti-space defense.¹¹ Such developments he expected to transform space from an ancillary sphere in the conduct of operations into an arena of armed struggle itself.

A year later in a review of developments in the natural sciences, which he foresaw as having a radical impact on military science and thereby on future war Anureev emphasized the fact that scientific-technical progress was itself becoming a decisive factor in estimating the correlation of forces between the two world systems and that this trend would accelerate over the next decade. One of the leaders within the Soviet military in the

¹⁰ I. I. Anureev, Oruzhie protivoraketnoi i protivokosmicheskoi oborony (Moscow: Voenizdat, 1971), pp. 5-6.

¹¹ Ibid., pp. 276-277.

application of operations research and systems analysis to problems of combat and weapons procurement, Anureev advocated greater employment of forecasting techniques in order to improve the quality of scientific foresight.¹² Anureev specifically drew his reader's attention to the links then being forged between military science and quantum mechanics, which he associated with the development of lasers and particle beams, and stated that this connection would "lead to the development of new areas of tactics, operational art, and strategy." He also called attention to this scientific-technical developments which were then creating opportunities for the automatization of troop control.¹³ In 1975 Anureev did a major study on the potential of multi-use space transports, in which NASA's plans for the "space shuttle" figured prominently. In the age of detente Anureev did not emphasize the potential utility of such transport systems for the further militarization of space and confined his remarks on its military utility to noting the role of the Defense Department as NASA partner in the venture. Anureev concluded that such multi-use transports would have significant utility if the savings involved in their recover and use proved as high as expected and if the turn around time on flights could be kept within reason. Anureev, however envisioned such craft as part of a larger and

¹² I. I. Anureev, "The Correlation of Military Science with the Natural Sciences," Voennaia mysl', No. 11, (November 1972), pp. 31-32.

¹³ Ibid., p. 34-36.

more diverse system of space transport, including a wide variety of lifters optimize for different types of missions.¹⁴

Shaposhnikov's lecture provides a number of critical insights regarding the Soviet conceptualization of the use of space to support combat on earth. First, under employment considerations affecting military space craft Shaposhnikov introduces three themes which are common to all Soviet discussions of the role of military technology within military doctrine [voennaia doktrina] the political aim of the war itself, the nature of the war, and the missions of the armed forces. Here doctrine shapes technology, rather than engineering capabilities providing "opportunities" to which military commanders must respond. At the same time the objective character of outer space, the recognition of various zones and determination of their particular military utility provides certain objective characteristics which define the technical parameters of military space systems. In this regard, space takes on the characteristic of any theater of military actions [TVD], i. e., the theater staff must prepare the theater for the conduct of combat operations. In this case, of course, the theater is more analogous to a modern maritime or ocean TVD with its three dimensional character, currents, and thermal effects in which hydrographic preparations provide the necessary scientific information to make possible optimal use of all types of naval

¹⁴ I. I. Anureev, Rakety mnogokratnogo ispol'zovaniia (Moscow: Voenizdat, 1975), pp. 56-73, 129-212, 205.

platforms and weapons. Shaposhnikov's focus upon immediate or near space is analogous to coastal and deep oceanic waters. The former is now much more important militarily because it is where most assets are deployed and where most missions can be performed. It is from this belt (60-70 to 1000 km) where reconnaissance, meteorological, topo-geodesic and communications operate in support of both civilian purposes and military missions. At the same time Shaposhnikov foresees the utilization of deep space for military purposes. "In the future the upper orbits of space will be utilized, and the entire space around the earth could be utilized for military purposes." Soviet scientific-technical literature on the exploitation of space points to a number of civilian utilizations for space.

Regarding the character of the space system itself there are three specific general features, which are worthy of note. The first concerns the universality of the systems components. None of these features is particularly surprising or unique as features. The second involves the evolution of the system which Shaposhnikov addresses in the shift from single-purpose systems to multi-purpose systems. The third refers to the distinctly Soviet approach to operational deployment, including the emphasis upon reinforcement capacity in a period prior to and during the start of hostilities. The foundation of a military space system is in the construction and expansion of its component parts so that system capacity is equal to the mission demands arising out of contemporary and future wars. This puts a high premium on

redundant capabilities for the construction of space craft and within the launch, control, and recovery systems. The general categories concerning the employment of military space craft are taken from the language of military science, i. e., reinforcement, deployment, concentration, radio-electronic struggle, combat readiness. These are concepts taken from military discourse on tactics, operational art, and strategy and applied to military actions in space. This reinforces the explicit point that there is one military science and that its language must apply to combat in all spheres. Space is a new medium for military actions offering truly inter-continental reach, but the Soviet approach emphasizes the integration of the military space system into support of war fighting capabilities back on earth.

Shaposhnikov's comments on the missions, role and scope of military spacecraft emphasize centralized control of space assets by the Soviet Supreme High Command which embrace both independent and joint missions with other means in support of all branches of the Soviet armed forces. Speaking of the main missions, he divides them into support and command control under contemporary conditions. In keeping with Soviet military doctrine, Shaposhnikov emphasizes a highly centralized system of communication, placing scarce space communication assets in the hands of the Supreme High Command and the General Staff, the Commanders of the various branches of the armed forces, and the commander of the group of forces operating with a TMAS.

Shaposhnikov outlines with precision and care the role of space assets in both a strategic nuclear exchange and theater-strategic operations in a continental theater of military actions. The treatment of operations within a TMA is, however, more systematic in its exposition.

Looking to the problem of future war, he identifies a third category of missions: "The future they will be employed to accomplish combat missions." For some idea of what such combat missions might involve, the reader might turn to Colonel Josef Smoter's more recent article on air defense operations looking out to the year 2000. In discussing an initial first strike, employing surprise, Smoter mentioned the use of laser weapons of space as one of the means of attacking enemy strategic offensive forces, strategic defense complexes, and energy and transportation networks.¹⁵ Judging by this lecture alone, one of the targets in such an attack would have to enemy space-based command and control and reconnaissance capabilities.

In his treatment of the support and command and control missions Shaposhnikov makes two points which relate to the employment of space assets in both types of missions. First, space assets are very special capabilities which greatly exceed those of earth-based systems in terms of range and response time. Second, while these capabilities offer substantial advantages space-based assets should be seen as part of an integrated system

¹⁵ Jozef Smoter, "Operations of National Air Defense Forces in a Possible War," Przegląd Wojsk Lotniczych i Obrony Powietrznej Kraju, No. 9, (September 1982), pp. 5-12.

employing both space and earth-bound assets and not as a replacement for such assets.

Radio-electronic struggle, the all encompassing term used by the Soviets to describe electronic warfare with its active and passive systems, jamming, counter-measures and counter-counter measures, occupies a prominent place in the lecturer's discussion of support missions. Since space-based communication systems offer greater protection against jamming, the need logically arises for the acquisition of other means of neutralizing such enemy assets and protecting one's own. The sub-text here becomes a question of anti-satellite capabilities and means of protecting such satellites from attack.

The problem of the future employment of radio-electronic struggle should also be considered. Orbiting spacecraft with special means will carry out missions to jam radio communications at the operational echelons of troop control of the enemy's armed forces and jam air defense, radio-technical means, anti-missile and anti-submarine defenses.

Under forms of combat employment of military space craft Shaposhnikov treats both individual and group actions. Under the former category he points to the specific needs of reconnaissance for nuclear strike operations including pre-strike target determination and post-strike damage assessment. Under group actions are the totality of support and troop control missions which mutually inter-act and connect to enhance the combat potential of all branches of the arms forces, taking part in a joint operation. Such groupings are for all intense and purposes to be covertly mobilized prior to the onset of hostilities, i.e.,

already deployed systems operating at less than capacity are to be brought up to strength, reserve assets in the form of stand-by space craft are deployed, and the deployment of existing assets are changed to enhance their capabilities.

Since war is a continuation of politics, Shaposhnikov emphasizes the fact that the military space system, like other elements of the armed forces, need not be configured for "war out of the blue." Strategic surprise is certainly a vital asset and a terrible danger in the nuclear age, hence the requirement that those space assets directed at early warning of an enemy's intention to mount such a strategic operation must be constantly kept at a heightened state of combat readiness. For other space-based systems the key to an effective military space system is the ability to increase combat capabilities in response to an emerging political-military crisis and at the start of hostilities. Thus, their combat readiness increases with the level of political-military tensions, reflecting a commitment to mobilization and surge deployment in war imminent situations. This requirement underscores his emphasis upon stand-by capabilities, which are to be deployed in a timely fashion.

We should note that Shaposhnikov gives the General Staff a prominent role in the planning and organizing the employment of space-based assets, thereby conferring upon the "brain of the army" vital functions in this "entirely new and significant phenomenon" which is crucial to strengthening the military power of the Soviet Union and the Warsaw Pact. This, in turn, raises

questions regarding the evolution of the Soviet military space system since these lectures and underscores the need to examine potential future developments.

Shaposhnikov's discussion of the technical characteristics of the Meteor meteorological satellite and the Molniia communication satellite underscore the simple fact that there are no fundamental distinctions between Soviet military and civilian capabilities. Since the late 1920s and the introduction of state standardization of goods to ensure that all production by the centrally-planned economy could be utilized in defense of the homeland, this has been regular practice. Its extension to space is not surprising. It does, however, raise a host of questions regarding the military utility of recent Soviet efforts to develop a permanent manned space station (Mir), its interest in a wide range of heavy single-use lifting bodies (Proton and Energiia), the modernization of its basic manned spacecraft (Soiuz-T), the testing of multi-use lifting bodies in the form of a small space plane and the existence of a larger shuttle-size prototype, and plans for the industrialization of space, including the generation of power and the use of microwaves to power future space craft. None of these developments need have an exclusively military purpose for their capacity to be at the call of the Soviet General Staff in time of crisis to provides means of enhancing the existing capacity of the Soviet military base system or in case of hostilities to attack an opponent's space assets.

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